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LIGHT-WEIGHT BUILDINGS FOR LIVING AND WORK (LABORATORNO-ZHILOE --ETC(U)
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LIGHTWEIGHT BUILDING FOR LIVING AND WORK

CORPS OF ENGINEERS, U.S. ARMY
COLD REGIONS RESEARCH AND ENGINEERING LABORATORY
HANOVER, NEW HAMPSHIRE

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The planned structure of the building was predetermined by the need to house laboratory workers, joined by common work and joint living in the severe climate of the Arctic. Lightweight prefabricated supporting and enclosing components of efficient materials comprise the design feature of the building.

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LIGHTWEIGHT BUILDING FOR LIVING AND WORK

The planned structure of the building was predetermined by the need to house laboratory workers, joined by common work and joint living in the severe climate of the Arctic.

The two two-storey residential blocks are joined by a two-storey insert, on the first floor of which is located the main entrance to the building with a group of vestibule spaces and a ventilation chamber, while a winter garden is located on the second floor. The unity of the building interior is created by two inside staircases emerging into a common vestibule and also by the possibility of access between the residential blocks through the winter garden. Entrances to one-and two-room apartments and to public use spaces are provided from the stair landings.

The unique composition of the residents made it possible to figure on organization of new and more improved forms of everyday life -- the general purpose and auxiliary spaces acquire an important role: lockers for storage of sports equipment at the building entrance and sections of drying cabinets for every five apartments in their immediate vicinity. A lounge for 25 seats with a kitchen and auxiliary spaces attached to it, game rooms for children and recreation rooms for adults have been arranged on the first floor of one of the residential blocks. These public spaces, including the winter garder, are designed to expand the sphere of contacts between the residents, to supplement leisure and to compensate for the difficulties of living in a severe climate. Moreover, the winter garden will make it possible to observe experimentally the nature of formation and operation of such spaces composed of residential or administrative buildings.

Hotel type residential apartments are provided for single scientific workers; apartments with kitchens, separate sanitary facilities and built-in cabinets and attic stories are designed for families.

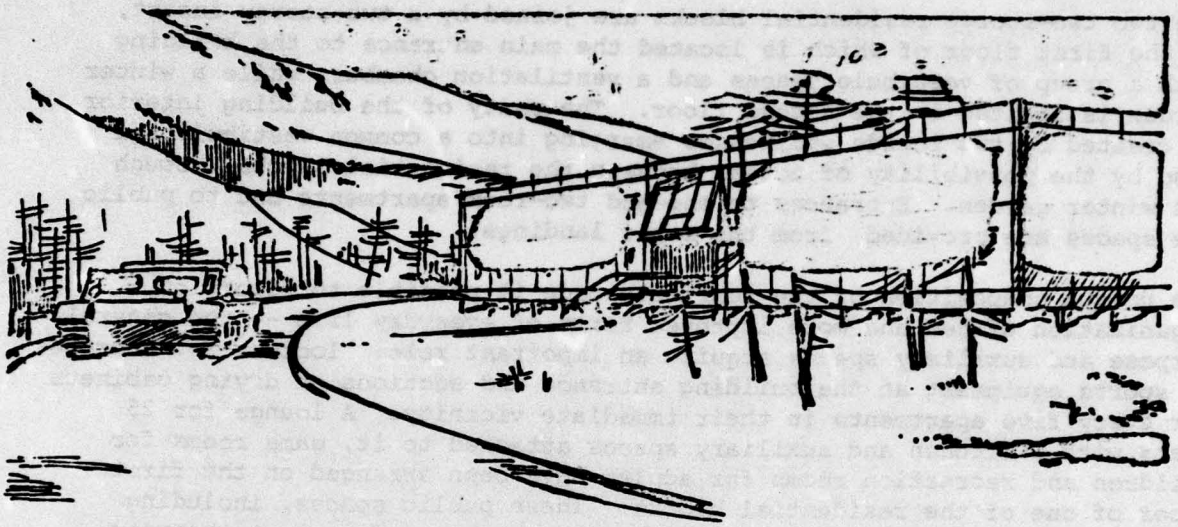
The planned building may easily be transformed into an ordinary apartment building or independent service building, to which the adopted layout structure with open staircases will contribute.

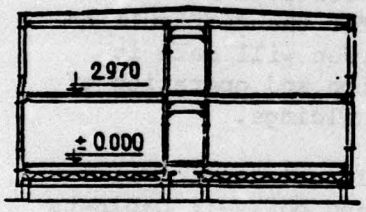
Lightweight prefabricated supporting and enclosing components of efficient materials comprise the design feature of the building.

The developed solutions make it possible to improve comfort conditions and also to accelerate and facilitate installation of the building from finished articles and parts without the use of heavy-duty hoisting equipment and wet construction processes. The building is a panel type with an interior steel supporting framework and enclosing structures of aluminum and efficient insulation.

It was designed for a calculated outside temperature of -50°C, wind load of 100 kg/m^2 and snow load of 100 kg/m^2. The building framework in the form of

transverse truss-partitions is made of section steel angles measuring 63 x 5 mm and 45 x 5 mm which are faced with dry plaster and are filled with mineral wool batts. The trusses are secured by bolts vertically to the floor slabs or foundations and in the transverse direction to beams of standard sections. The truss and beam framework weighs 1.5 times less than a frame type structure.





Cross-Section

The three-layer enclosing room-size panels are made of aluminum slabs secured to a framework of plywood angles and FRP-1 phenol styrofoam with a volume weight of 50 kg/m^3. The panels are suspended to the supporting partitions by bolts. The vertical joints between the panels are filled with sealing plates and covered with aluminum strips, while the horizontal joints are flange type. The panels are finished on the facade with pentaphthalic enamels.

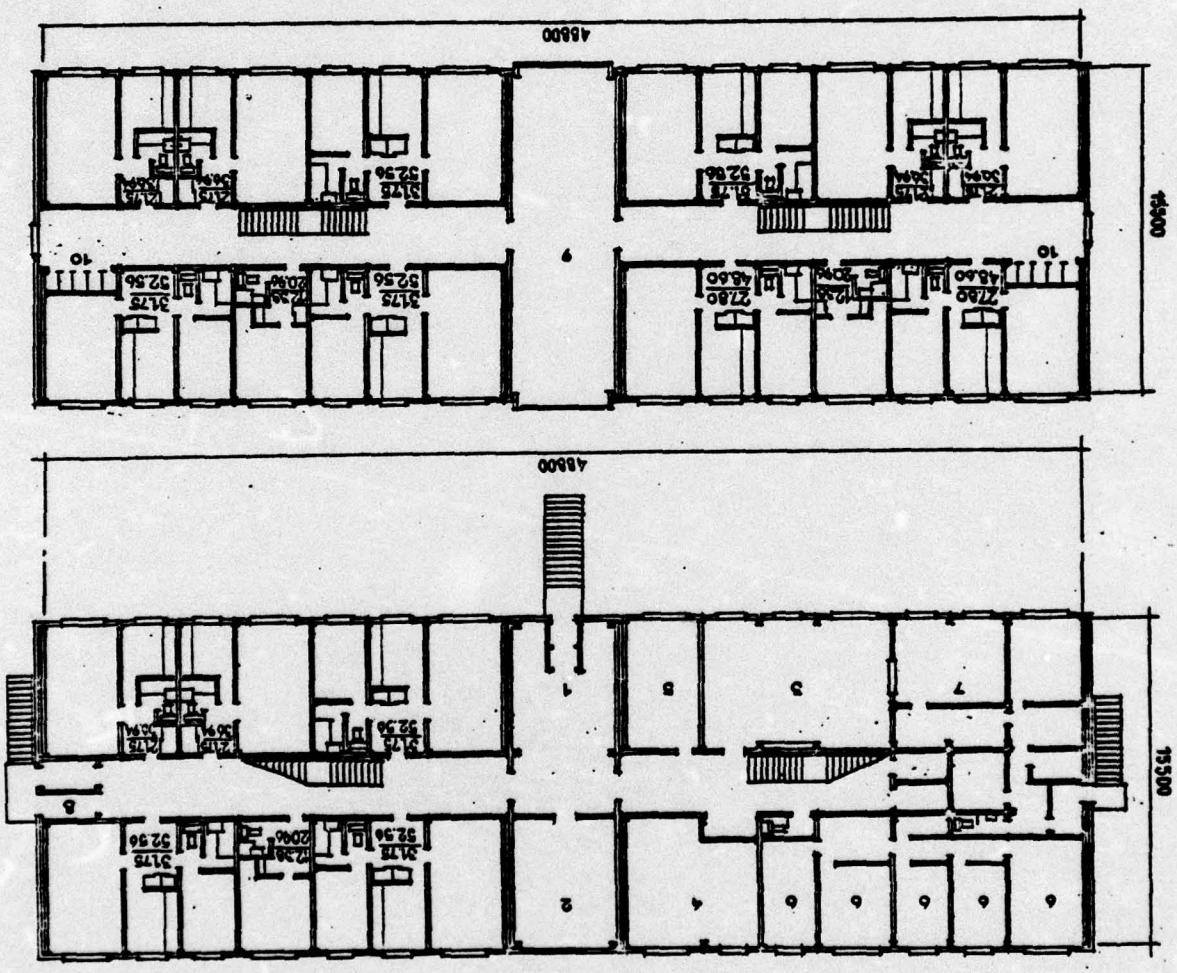
All the partitions are made room size from steel sheathing and wood filler.

Glazing is triple.

The building is being constructed at Amderma by the Arktikstroy Trust for the Permafrost Laboratory of LenZNIIEP [Leningrad Zonal Scientific Research and Planning Institute for Typical and Experimental Design of Residential and Public Buildings].

Main Indices:

Number of apartments	18
Including:	
type 1A	3
type 1B	6
type 2B	9
Total area in residential section, sq. m	842
Total area in public section, sq. m	260
Total area of building, sq. m	1,102
Construction volume, cub. m	4,815
Cost of 1 cub. m., rubles	139



First floor layout; second floor layout: 1 -- vestibule; 2 -- ventilation chamber; 3 -- lounge; 4 -- recreation room; 5 -- kindergarten; 6 -- laboratory work rooms; 7 -- kitchen; 8 -- trash room; 9 -- winter garden; 10 -- drying cabinets